

Air Force Wargaming Institute



WARGAME COMPENDIUM ACADEMIC YEAR 2022-2023

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FOREWORD

The LeMay Center for Doctrine Development and Education leads the United States Air Force in the development of timely, relevant, and influential doctrine, and acts as the Air Force's arbiter on doctrinal issues and positions. A key task includes promoting and assessing the integration of doctrine in exercise scenarios, wargames, models, and simulations. The Air Force Wargaming Institute (AFWI) defines a wargame as a unique interactive research model using purposefully selected game participants to generate data that does not already exist in response to purposefully developed scenarios for analysts to use in developing insights or options in response to a sponsor's problem. Wargaming is used at Air University (AU) as a means of applying and reinforcing doctrine-based warfighting principles taught in officer and enlisted PME programs and supports sponsor requests from Department of Defense components and combatant commands, and Allies and Partners.

This Compendium is designed to show the scope of the Air Force Wargaming Institute (AFWI) wargaming program for AY 2022-2023 with a general description and objectives for each wargame. Questions or comments about the Wargame Compendium should be directed to AFWI at 334-953-5759 (DSN 493) or by email to: AFWI@us.af.mil.

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INTRODUCTION

BACKGROUND

The 1975 Clements Blue Ribbon Panel on Excellence in professional military education cited a need for service schools to develop curricula that stressed warfighting. The panel noted that service schools needed to sharpen students' knowledge of decision-making in combat. In 1976, the Air Force Chief of Staff's CONSTANT READINESS Tasking directed the development of intensive courses and methods for instruction in warfighting. In short, the tasking directed AU to "put more war in the War College." From these two initiatives evolved the concept for the Air Force Wargaming Institute. In September 1982, the Assistant Secretary of the Air Force for Financial Management established a program management office at Maxwell Air Force Base, Alabama to acquire a comprehensive wargaming capability for the Air Force. The facility was dedicated and opened its doors in 1986. In 2007, AFWI's parent organization, the College of Aerospace Doctrine Research and Education, merged with the Air Force Doctrine Center to become The LeMay Center for Doctrine Development and Education. Today, this wargaming capability consists of the personnel, facility, hardware, and software necessary to provide a broad range of wargames and exercises to the Air Force (AF), the Department of Defense (DoD) and other international sponsors. AFWI also supports AF and Combined, Joint Title 10 Wargames. A full scope of AFWI's programs and responsibilities can be found in the following pages.

AFWI MISSION STATEMENT

Provide a world-class Wargaming Enterprise with compelling operations, technology, and facility capacity across all levels of classification to advance USAF and joint force capabilities against peer competition.

FACILITY

The Cleveland Wargaming Center building is a special-purpose, 56,000 square-foot facility. AFWI can operate in whole, or in part, as a secure, classified work environment. The building contains 23 seminar and/or wargaming rooms and four conference rooms—all with audiovisual capabilities. The building is designed for maximum flexibility and can be configured to accommodate different wargames and exercises.

AFWI AS A WARGAMING CENTER OF EXCELLENCE

AFWI provides tactical to strategic-level wargames to educate and train senior warfighters, commanders, and their staffs. These wargames (1) focus on joint warfare, and integrated air, space, and cyberspace power; (2) strengthen the decision-making abilities of future commanders and their staffs in realistic, simulated combat, Humanitarian Relief, or Homeland Defense environments; and (3) provide direct support to AU schools and other USAF, DOD, and international customers.

In a typical year, AFWI plans, develops, conducts, or supports approximately 35 wargames and exercises. AFWI uses computers, simulation models, board games, table-top exercises, and seminars to

address how military forces deploy, fight, and sustain combat. AFWI provides a “laboratory environment” in which current and future commanders and their staffs are given the opportunity to study warfare realistically and identify problems in peacetime before they face them in combat.

In addition to excelling at developing and executing relevant, world-class wargames, AFWI can provide a secure environment for highly sensitive or classified discussions for other users. AFWI hosts Air War College, Air Command and Staff College, and Squadron Officer College classified electives as well as doctrine forums, Flag Officer Warfighter Courses, and various Title 10 wargames within the Cleveland Wargaming Institute building.

WARGAME MODEL AND SIMULATION TOOLS

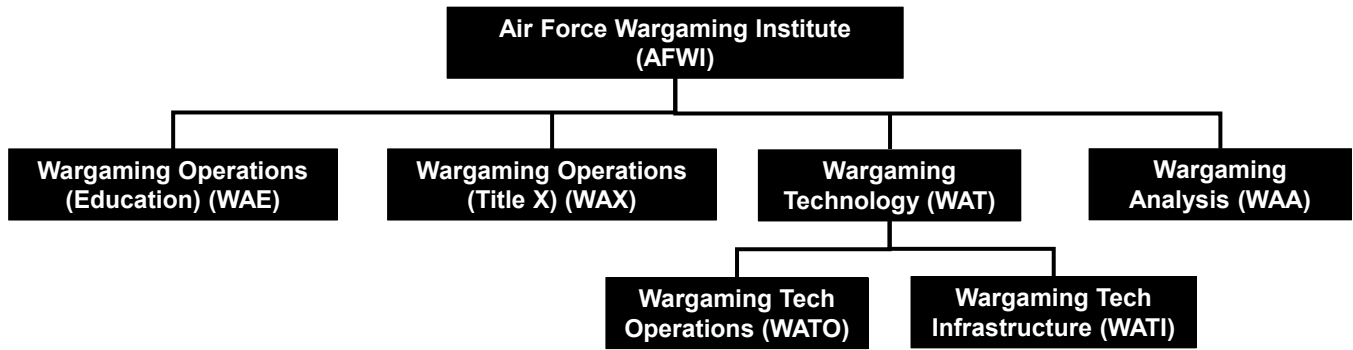
AFWI assists operational sponsors and AU schools achieve their objectives with wargaming support for tabletop exercises, board games and simulation-based wargaming support by focusing input mechanisms around a campaign-planning construct based on the latest doctrine procedures. The resultant wargames can then be driven from decision criteria to decision criteria, rather than by artificial time increments. In this manner, AFWI can also support the investigation of much longer pieces of campaign plans. This is a critical capability to enable Air University schools to fully realize the educational objective of developing operational and strategic thinkers.

AFWI continues to take advantage of emerging wargame technology to improve current systems and more easily update and quickly configure systems for multiple customers. The goal of the transformation is to have fewer tools with lower support costs and with increased capabilities providing improved support to the wargames. AFWI uses the Synthetic Theater Operations Research Model (STORM), the Joint Theater Level System-Global Operations (JTLS-GO) and the Command Professional Edition (C-PE) simulations and software to support wargames requiring modeling and simulation (M&S) support. STORM is a state-of-the-art, computer simulation specifically designed to offer Department of Defense (DoD) organizations key strategic insights into military force structure, capabilities, and overall operational effectiveness. JTLS-GO is an interactive, internet-enabled simulation that models multi-sided air, ground, and naval civil-military operations with logistical, Special Operation Force (SOF), and intelligence support. C-PE is a commercial simulation and wargaming tool which provides a scalable simulation engine that can be tailored to meet a range of needs from wargaming and training to simulation and analysis.

AFWI interacts with the wargaming and modeling and simulation (M&S) communities through participation in AU, Air Education and Training Command (AETC), AF, DOD and commercial conferences, symposiums, and meetings.

ORGANIZATION

AFWI is a directorate in the Curtis E. LeMay Center for Doctrine Development and Education. The directorate has billets for a staff of 17 officers, 26 enlisted and 34 civilians organized into three wargaming operations divisions and one technology division. The divisions work in unison to conduct wargaming. In addition, the divisions are responsible for identifying the tools, wargame materials, models and subject matter expertise required to successfully conduct wargames and exercises.



The divisions manage the comprehensive wargaming lifecycle process to execute wargames. Our Wargame Directors translate a sponsor’s goals and objectives into the design of a wargame used to develop insights or options in response to a sponsor’s problem. The Wargame Director is responsible for the overall structure of a game which starts with a conversation with a sponsor and ultimately ends with a final report back to the sponsor.

Wargaming Operations Education (WAE) provides wargaming support to Air University schools as well as to other services’ educational organizations. Wargaming Operations Title10 (WAX) supports the CSAF’s Title 10 wargames, Air Force Futures and Global Engagement, conducts U.S. Strategic Command’s Power Series wargames, and supports other requests from combatant commands and major commands for wargaming support. Wargaming Analysis (WAA) engages with the sponsor to determine requirements, assists wargame directors to ensure games generate data responsive to the sponsor’s problem, and leads the efforts to develop the post-wargame final report and brief.

The Wargaming Technology Division (WAT) plans, integrates, and maintains AFWI network and computer systems. This division provides the wargaming divisions with expertise on all technical issues relating to hardware, software development, simulation, modeling, and wargaming tools support.

WARGAME OVERVIEWS

This section provides a brief overview of wargames and computer models supported by AFWI for AY 2022-2023. For further information, contact AFWI by e-mail at AFWI@us.af.mil.

AFWI also sends small contingents of its members to the following DoD events in support of other Air Force and sister service wargames, exercises, and events:

- Air Force Futures
- Air Force Global Engagement
- Army Future Studies Wargames
- Deterrence and Escalation Game and Review (DEGRE) Wargame
- Globally Integrated Wargame

- Global Mobility
- Long Duration Logistics Wargame
- AFMC's Science & Technology Wargame

SCHRIEVER WARGAME 23

The Schriever Wargame (SW) is the United States Space Force's (USSF) Title-10 operational wargame series. SW23 focused on critical aspects of the space and cyber domain across the spectrum of conflict while engaging our partners at the operational and strategic levels, leading to key outcomes focused on strengthening national and multinational priorities. The wargame challenged participants from eight nations to coordinate space systems, cyber capabilities, and doctrinal concepts to achieve objectives and maintain a peaceful space domain.

Concurrently, the USSF Chief of Space Operations (CSO) led a Coalition Council of senior multinational civil and military leaders to discuss space-related policy and operational topics in a risk-free, non-attributional environment.

Approximately 350 military, civilian, and commercial experts from more than 25 commands and agencies throughout the U.S. Government, as well as international partners from Australia, Canada, France, Germany, Japan, New Zealand, the United Kingdom, and 14 commercial service providers participated in the wargame.

AFMC's SCIENCE AND TECHNOLOGY WARGAME

AFMC's Science and Technology (S&T) Wargame is a computer-assisted, operational wargame sponsored by AFMC and AFRL to test next-generation warfighting capabilities and concepts against a future real-world scenario with the goal of identifying the most promising concepts and develop lessons learned for future wargames and analyses. Approximately 107 military, civilian, and commercial experts from the Department of Defense commands and agencies of the U.S. Government, as well as international partners from Australia and Great Britain participated in the wargame.

JOINT LAND, AIR, AND SEA STRATEGIC EXERCISE (JLASS-SP)

JLASS-SP is a computer-assisted, theater-level seminar wargame. It is the only joint-sponsored wargame conducted by the PME senior-level colleges. The overall goal of the wargame is to enhance joint PME through an examination of potential US military responses to regional crises. The primary focus is on joint and combined warfare conducted at the operational and strategic levels. The current JLASS-SP wargame is played at the unclassified level and has over 200 students and faculty from U.S. Senior Defense colleges: United States Army War College (USAWC), Naval War College (NWC), Air War College (AWC), National Defense University (NDU) as well as student groups from the Swedish Defense University (SDU), Chilean Army War College (CAWC), and Nigerian Army War College (NAWC) through bilateral agreements.

GLOBAL CHALLENGE (AWC)

U.S. Air Force's War College (AWC) Academic Year (AY) 2023 capstone exercise, Global Challenge, was conducted using the Operational Wargame System (OWS), specifically focused on the Assassin's Mace (INDOPACOM AOR) and Zapad (EUCOM AOR) scenarios within OWS. The wargame provided an opportunity for the student body to demonstrate mastery of the material and concepts covered over the entirety of the academic year and provide direct application towards response within a future conflict. Students were required to respond to a crisis, develop an operational approach, then wargame that approach in one of the two possible scenarios. Faculty leveraged the Global Challenge wargame to assess the strategic and operational acumen of their students, demonstrating thoughtful, reasoned recommendations and decisions in both their briefings and wargame activities.

SABOTEUR'S MALLETT (ACSC)

U.S. Air Force's Air Command Staff College (ACSC) Academic Year (AY) 2023 capstone wargame, Saboteur's Mallet, used a high-level combat adjudication tool developed by ACSC faculty and AFWI staff. As a capstone event, the wargame required students to apply lessons from across the academic year. The wargame required the students to critically think while demonstrating their understanding of joint capabilities, planning processes, and Area of Responsibility (AOR) related issues. The game included conducting operations in an ambiguous and contested environment against a thinking opponent and adjusting plans according to the evolving situation.

JAGZILLA

JAGZILLA is computer assisted capstone wargame events for the Air Force Judge Advocate General's School (AFJAGS). JAGZILLA is unique in that it combines students from the Staff Judge Advocate's Course (SJAC) and the Law Office Manager's Course (LOMC) in a single wargame. It is a one-day event that teams one Judge Advocate with a Paralegal to form the leadership of a wing Legal Office. JAGZILLA is played at the unclassified level.

FUTURE CAPABILITIES GAME

"AF Futures" is one of the two Air Force Chief of Staff wargames. It is a long-range strategic planning activity comparing alternative futures and force structures to support the Air Force's Title 10 planning efforts. AF Futures influences (and is influenced by) the USAF's other Title 10 wargame, the "Global Engagement" series. The insights gleaned from Futures impact USAF strategic planning, concept development, and force structure investment streams. As a long-range planning activity, Futures focuses on evaluating strengths and weaknesses of future concepts based on the USAF vision and strategic plans and to test alternative force structure to help shape future investment strategies. The first year of the two-year cycle focuses on planning the game's specific objectives, developing the game's scenario, and evaluation criteria. The second year of the wargame cycle focuses on executing the wargame and analyzing how the results should shape future strategic decisions. This wargame is played at the SAP-informed classified level.

POWER WARGAME

The Power Series is named after General Thomas Power, the commander of Strategic Air Command during the Cuban Missile Crisis. It addresses difficult problem sets and strategic questions facing the United States. The most recent iteration, Power 23 Spring, addressed a EUCOM-focused scenario that looked at restoring and maintaining deterrence in the face of potential escalation. It provided an environment for strategic decision makers, in concert with ACSC's Joint All Domain Strategist (JADS) and School of Advanced Nuclear Deterrence Studies (SANDS) students, to explore deterrence, escalation, signaling, and allied assurance concepts through game play, incorporating all instruments of national power at the strategic level. The wargame bridged the gap between analytic and educational wargames by involving JADS and SANDS students in a realistic strategic scenario with objectives determined by USSTRATCOM. The game outputs were briefed to the Deputy Commander Global Strike Command and the Chief of Staff of the Air Force.

AIR FORCE MEDICAL SUPPORT TO FUTURE FIGHTS WARGAME

The U.S. Air Force Medical Support to Future Fights Wargame was conducted by AFWI from 24-26 January 2023 in the Cleveland Wargaming Institute Building at Maxwell AFB, AL. This wargame supported the Air Force Medical Readiness Agency (AFMRA). The intent of the wargame was to test the capability and effectiveness of a new medical force presentation design concept in the Air Force, Force Generation (AFFORGEN) model to support line of the Air Force (LAF) conducting Agile Combat Employment (ACE) operations in a future fight scenario. Subject matter experts from across the Air Force medical community participated in the wargame. The participants were given two separate vignettes to test the new medical force design's ability to provide medical support in a Pacific theater conflict. The wargame results were then analyzed to extract potential doctrine, organization, training, (existing) materiel, leadership and education, personnel, facilities, and policy (DOTmLPP-P) mitigation strategies to identified capability gaps in Air Force medical capabilities and implications for the USAF.

KINGFISH ACE

KINGFISH ACE is a HAF/A5 logistics wargame board game. The game is focused on the planning, deployment, and execution of Multi-Capable Airmen (MCA) supporting agile combat employment (ACE) concepts. The game is intended to help military planners and Multi-Capable Airmen understand the relationships between task, threat, capabilities, timing, and the complexities of ACE.

AFWI

The Air Force Wargame: Indo-Pacific (AFWI) is an educational, low-fidelity game set in in the INDOPACOM theater to teach wargaming basics. The board game is played with tokens, cards, a four-sided die using the intersection of airpower with ground, space, cyber and maritime domains.

PACE

The Primary Alternate Contingency Emergency (PACE) game is an educational game intended to quickly teach the strengths and weaknesses of various communications capabilities in a Denied,

Disrupted, Intermittent, and Limited environment. The game places players in the roll of a planner responsible for establishing SATCOM, RADIO, and TERRESTRIAL comm systems at a contingency operating location and defending against adversary kinetic, electromagnetic, and cyber-attacks.

PROJECT ICARUS SPACE DEBRIS

The 2023 Project Icarus Space Debris game is conducted by AFWI in support of the study sponsor agency, ACSC's Space Department. The intent of the game is to provide an educational game that is not "war" focused but provides ACSC students a hands-on experience with simulated international negotiations and a greater understanding of the complexities of the "space debris" dilemma in outer space. Through design methodology, students portray actors from governmental, non-governmental, and private industry all with vested interest and incentive towards resolution of international policy and procedures for management of "space debris" monitoring, cataloguing, and eventual clean-up. The game design presents challenges towards managing "space debris" activities to limit opportunities towards dual-purpose space platforms utilized for "space debris" clean up to also become a means for belligerent activities in space.

PROJECT OLYMPUS

Project Olympus serves as a capstone game for Space Force SOS students to test their COAs developed during their instruction on the Joint Planning Process. It represents an abstract space environment with a variety of satellites and orbits. Players respond to four phases of events representing the build up to and initiation of conflict in space, additionally requests come from other Joint Component Commanders for support and priorities to place the students in a joint mindset.

US Air Force Europe (USAFE) ACE

AFWI conducted a tabletop exercise (TTX) with United States Air Forces Europe (USAFE) at the Weapons and Tactics (WEPTAC) conference in September 2022. The TTX used a generalized High North scenario in the European theater with two vignettes to examine the timeline and key decision points in a Proactive ACE maneuver and relocation during Cluster Base Operations. The vignettes were specifically designed to focus on ACE Command and Control and further investigate Situational Reports (SITREPs), ACE Plans, and identify areas where clarification and additional guidance are required. The TTX achieved its desired objective and identified some additional critical items that require exploration when considering ACE operations.

MODELS

Command Professional Edition (CPE)

CPE allows players operational control over units on a 2D map of the Earth. Similar to Harpoon, players can command their units using pre-set missions, or by giving direct instructions of the "Go here, do this" variety. The size and scale of the engagements is dependent only on the scenario; the engine can perform small patrol boat battles right up to global warfare, with hardware performance being the only relevant limitation to scale. Individual scenarios vary from a few hours to multiple days of real time, although time can be accelerated to allow faster completion of operations. CPE features a scenario editor that allows for real-time changes to scenarios under construction, allowing battles in the editor to be run and changed instantly. AFWI designed and built a process to input a batch of orders obviating the need for direct controller and/or player interaction during the execution of the run.

Joint Theater Level Simulation – Global Operations (JTLS-GO)

JTLS-GO ® is an interactive, Internet-enabled simulation that models multi-sided air, ground, and naval civil-military operations with logistical, Special Operation Force (SOF), and intelligence support. The primary focus of the JTLS-GO system is conventional joint and combined operations at the Operational Level of War as defined by the Joint Staff's Universal Joint Task List. JTLS-GO explicitly simulates air, land, sea, amphibious, and SOF operations. The simulation supports exploring both low-intensity conflict and pre-conflict operations as well as Humanitarian Assistance and Disaster Relief operations. It has limited nuclear and chemical effects representation.

Synthetic Theater Operations Research Model (STORM)

STORM is the Air Force's campaign model solution, integrating air, space, sea, land and cyberspace domains. STORM is a dynamic, complex analytic simulation representing campaign-scale military operations in a joint war fighting context. The model supports force structure decisions, analyze potential force employment options and evaluate the contribution of various weapons and weapon systems to the outcome of key objectives in campaign-level conflicts.

Standard Wargame Integration Facilitation Tool (SWIFT)

The Standard Wargame Integration Facilitation Toolkit (SWIFT), an Office of the Secretary of Defense, Cost Assessment and Program Evaluation (OSD CAPE) product, provides a computer environment that supports Department of Defense (DoD). SWIFT is a software environment used to build, play, and analyze turn-based wargames conducted primarily for analytic purposes. SWIFT provides a toolkit to enable integration of visualization, wargame rules, human and computer-based adjudicators into a multi-player turn-based wargame to facilitate testing, execution, and analysis.

Vassal

The Vassal Engine is a game engine for building and playing online adaptations of board games, tabletop games and card games. It allows users to play in real time over a live Internet connection and play by email. It runs on all platforms and is free, open-source software.

FalconView

FalconView is a mapping system created by the Georgia Tech Research Institute. It was initially developed for the Windows family of operating systems; however, versions for Linux and mobile operating systems are under development. It displays various types of maps and geographically referenced overlays. Many types of maps are supported, but the primary ones of interest to most users are aeronautical charts, satellite images and elevation maps. FalconView also supports many overlay types that can be displayed over any map background. The current overlay set is targeted toward military mission planning users and is oriented towards aviators and aviation support personnel. FalconView is an integral part of the Portable Flight Planning Software (PFPS). This software suite includes FalconView, Combat Flight Planning Software (CFPS), Combat Weapon Delivery Software (CWDS), Combat Air Drop Planning Software (CAPS) and several other software packages built by various software contractors. Current work includes the development of FalconView as part of XPlan, the Department of Defense's most recent mission planning system. The Joint Mission Planning System is also being added to FalconView as a plugin. The program has an active user community, and the Georgia Tech Research Institute plans events supporting the program.

GAMENet

GAMENet is a web-based US Naval War College wargame information management system. The system wargaming application components allows a wargame director to create the information architecture that supports operational wargaming information management, dissemination and decision-making for the game players and control team. The components include a chat, survey, discussion, files, Sitrep, Order of Battle and mapping capability.

Future Capabilities

AFWI is exploring emerging machine learning and artificial intelligence technologies to aid in wargame design and execution. Areas under consideration include game objectives, scenario, database, models, rules and opposing force development and game play.